U. S. DEPARTMENT OF COMMERCE
NATIONAL BUREAU OF STANDARDS
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Letter Circular
LC-714
(Supersedes
LC-632)

January 23, 1943.

SOUND ABSORPTION COEFFICIENTS OF THE MORE COMMON ACOUSTIC MATERIALS.

The following figures have been obtained at the National Bureau of Standards for the sound absorption coefficients of a number of acoustic materials which are on the market. The bulk of the measurements are on materials submitted by the makers. The measurements on some of these materials were made several years ago. Technologic changes in manufacture, some induced by the war, may have caused differences between the coefficients of materials now on the market and those of materials originally tested. However, an attempt has been made to reduce the effect of variations in manufacture by including the coefficients only for those materials which the makers state are essentially the same as when the tests were made.

The inclusion of a material in this letter circular is not to be construed as a general approval. Each material should be judged on its merits in any particular case as there are other requirements besides sound absorption which must be considered, such as fire resisting qualities, light reflection, appearance, etc. Figures are also given for the absorption of an audience seated in chairs of different kinds. All the results have been obtained by the reverberation method on samples having an area of approximately 72 square feet.

The sound absorption coefficient of a material is defined as the fractional part of the energy of a sound wave that is absorbed at each reflection. Experimental figures such as are given here must be regarded as approximate only. This branch of applied science is new and in a state of development. The methods and formulas used in obtaining these figures are those which, while not entirely satisfactory, are open to the least objection. The uncertainty involved is such that all the coefficients are probably somewhat too large.

The "noise coefficient" given in the table is the average, to the nearest multiple of 0.05, of the coefficients for 256, 512, 1024, and 2048 cycles. It has been recommended by many consultants that such a coefficient be used when the problem is one of reducing the noise level, as in offices, restaurants, etc.

Many of the acoustic materials exhibit large variations in their sound absorption properties when the method of mounting is changed. In many cases the most important feature is the amount of air space

back of the material. The figures given in this letter circular apply only when the materials are mounted in the same manner as when tested. For this reason the exact method of mounting is given for each test.

Acoustic plasters require special skill in their application, as improper manipulation may reduce the coefficient. Particular attention is called to the fact that a dry base coat is used for most applications. Also, the sound absorption coefficients are affected quite materially by the time between the application of the first and second coats of acoustic plaster, the amount of moisture in the surface of the plaster when it is finally floated, or finished with a trowel or by other means; and other factors of this nature.

A number of materials have been painted and retested to determine the effect of painting. In every case the paint was applied so as to decrease the sound absorption as little as possible and still obtain a reasonably good paint job. Details of the manner in which the paint was applied on any particular material will be supplied upon application.

It is not necessarily the case that the materials of highest coefficient are the most advantageous. When there is room enough to apply the requisite quantity, a material of low coefficient will give better results than one of higher absorption, because of the more uniform distribution of material. Also, in comparing different materials it should be borne in mind that there is some variation in manufacture; hence, the sample which was measured may have more or less absorption than the material delivered on the job. Minor differences in coefficients, therefore, should be disregarded in choosing between materials.

For the foregoing reasons it is advisable in drawing up specifications for auditoriums to lay emphasis upon the reverberation time desired rather than upon coefficients of material. See National Bureau of Standards Circular C418 entitled "Architectural Acoustics," which may be obtained from the Superintendent of Documents, Government Printing Office, Washington, D. C., at 5 cents per copy. Supplementary data on any of the materials mentioned in this letter circular will be furnished on application.

Additional information regarding the absorption coefficients of acoustical materials may be obtained from the Acoustical Materials Association, 120 South LaSalle Street, Chicago, Illinois.

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CORRECTION SHEET

LC-714

1. p. 5, Item 10 under "Types of Mounting" should read "Nailed on 2 x 8's, 12" o. c., unless otherwise indicated."

2. p. 6, Cushiontone A-3, weight should be "1.27" and not ".95" as indicated.

3. p. 6, Temlok De Luxe 1/2", weight "1.18" should be deleted.

TRADE NAME OF ACOUSTIC MATERIALS.

Trade Name	Manufacturer	Address	Page
Absorbatone	Luse Stevenson Company	873 Blackhawk Street, Chicago, Illinois.....	14
Absorbex	The Celotex Corporation	120 South LaSalle Street, Chicago, Illinois ...	7
Acoustex	National Gypsum Company	Buffalo, New York	14
Acoustical Cork "B"	United Cork Companies	Kearny, New Jersey	16
Acoustic Plaster	Hollywood Stucco Products, Inc.	5244 Vineland Avenue, North Hollywood, Calif. .	20
Acoustic Plaster	The Kelley Island Lime and Transport Company	Leader Building, Cleveland, Ohio	21
Acousti-Celotex	The Celotex Corporation	120 South LaSalle Street, Chicago, Illinois ..	7,8,9,10
Acoustilite	The Insulite Company	500 Baker Arcade Bldg., Minneapolis, Minn. ...	12
Acousti-Metal	National Gypsum Company	Buffalo, New York	14,15
Acoustone	United States Gypsum Company	300 West Adams Street, Chicago, Illinois	16
Air-Acoustic Sheets	Johns-Manville Sales Corp.	22 East 40th Street, New York, N. Y.	12
Akoustolith Tile	R. Guastavino Company	660 Main Street, Woburn, Mass.	10-11
Audience (Seated in different types of seats)	-	-	25
Balsam Wool	Wood Conversion Company	First National Bank Bldg., St. Paull, Minn. ..	17
Basalt Rock	Basalt Rock Company	Napa, California	7
Cabots Quilt	Samuel Cabot, Inc.	141 Milk Street, Boston, Mass.	7
Calacoustic Plaster	Pacific Portland Cement Co.	111 Sutter Street, San Francisco, Calif.	22
Cork Acoustical	United Cork Companies	Kearny, New Jersey	16
Cushiontone	Armstrong Cork Company	Lancaster, Pennsylvania	6
Dodson Acoustic Plaster	Dodson Manufacturing Co.	1463 Barwise, Wichita, Kansas	19
Econacoustic	National Gypsum Company	Buffalo, New York	15
Felt	The Felters Company, Inc.	214 South Street, Boston, Mass.	10
Fiberglas Acoustical Blankets	Owens Corning Fiberglas Corp.	Toledo, Ohio.	15
Fiberglas OC-9 Board	Owens Corning Fiberglas Corp.	Toledo, Ohio	15
Fiberlite	The Insulite Company	500 Baker Arcade Bldg., Minneapolis, Minn. ...	12
Fibracoustic	Johns-Manville Sales Corp.	22 East 40th Street, New York, N. Y.	12

Trade Name	Manufacturer	Address	Page
Hushkote Acoustic Plaster	Cleveland Gypsum Supply Company	1276 West Third Street, Cleveland, Ohio.	19
Kencoustic	David E. Kennedy, Inc.	58 Second Avenue, Brooklyn, New York	13
Kentex	" " " "	" " " " " "	13
Koustex	" " " "	" " " " " "	13
Limpet	Keasbey & Mattison Company	Ambler, Pennsylvania	20,21
Macoustic Plaster	National Gypsum Company	Buffalo, New York	22
Muffletone	The Celotex Corporation	120 South LaSalle Street, Chicago, Illinois	10
Nashkote	Johns-Manville Sales Corp.	22 East 40th Street, New York, N. Y.	12
Nuwood Bevel Lap Tile	Wood Conversion Company	First National Bank Bldg., St. Paul, Minn.	17
Old Newark Acoustic Plaster	Newark Plaster Company	50 Church Street, New York, N. Y.	22
Perfatone	United States Gypsum Company	300 West Adams Street, Chicago, Illinois	16
Permacoustic	Johns-Manville Sales Corp.	22 East 40th Street, New York, N. Y.	12
Plastacoustic	R. Guastavino Company	660 Main Street, Woburn, Mass.	19
Pyrocustic	Mitchell & Smith	9501 Copeland Avenue, Detroit, Michigan	14
Quietone	United States Gypsum Company	300 West Adams Street, Chicago, Illinois	16
Reverbolite Plaster	The Celotex Corporation	120 South LaSalle Street, Chicago, Illinois	18
Sabinite Plaster	United States Gypsum Company	300 West Adams Street, Chicago, Illinois	23,24
Sanacoustic	Johns-Manville Sales Corp.	22 East 40th Street, New York, N. Y.	12,13
Seats (See Audience)	-	-	25
Softone	Industrials Inc. of Wisconsin	333 N. Michigan Avenue, Chicago, Illinois	11
Sphinxstone	The Sphinx Acoustical Co.	c/o Wm. J. Davey, 1916 Locust Grove Road, Silver Spring, Maryland	16
Sound Isolation Blanket	Johns-Manville Sales Corp.	22 East 40th Street, New York, N. Y.	13
Spray-Acoustic, Type X	Sprayo-Flake Company	2715 Irving Park Road, Chicago, Illinois	23
Stucoustic	California Stucco Products of New England, Inc.	169 Waverly Street, Cambridge, Mass.	18
Studio Element	Johns-Manville Sales Corp.	22 East 40th Street, New York, N. Y.	13
Super-Acoustic Plaster	Gypsum Insulation & Mfg. Co.	1252 Lawrence Street, Los Angeles, Calif.	20
Temlok DeLuxe	Armstrong Cork Company	Lancaster, Pennsylvania	6
Transite Acoustical Units	Johns-Manville Sales Corp.	22 East 40th Street, New York, N. Y.	13
Travacoustic	National Gypsum Company	Buffalo, New York	15
Trutone	Acoustone Company, Ltd.	121 C.C.Chapman Bldg., Los Angeles, Calif.	6

TYPES OF MOUNTING

1. Cemented to gypsum wall board. This is considered equivalent to cementing to plaster or masonry.

2. Nailed on 13/16" x 2" furring, 12" o.c., unless otherwise indicated.

3. Metal supports attached to 13/16" x 2" wood furring.

4. Laid directly on laboratory floor.

5. Nailed on 2 x 4's, 12" o.c., unless otherwise indicated.

6. Cemented to the floor of the reverberation chamber.

7. Back of sample covered with concrete.

8. Attached to metal suspension system. 4" air space back of tile, unless otherwise indicated.

9. Acoustic tile nailed to 13/16" x 2" furring, 18" o.c., space between furring filled with Rockwool.

10. Nailed on 2 x 8's, 12" o.c.

11. Laid on 24 gauge sheet iron, nailed to 13/16" x 2" furring, 24" o.c.

Sound Absorption Coefficients and Description of Test Samples

TABLE I

Prefabricated Acoustic Units.

Material	Thickness	Mounting (See Page 5)	Coefficients 128	256	512	1024	2048	4096	Noise Coef.	Size of Unit Tested	Wt. (lb) sq ft	Surface	Date
ACOUSTONE COMPANY, LTD.													
Trutone Tile, cast on 1/4" gypsum wall board	7/8"	4	.16	.17	.48	.82	.65	.74	.55	12"x24"	-	Spray painted by manufacturer	1932
ARMSTRONG CORK CO.													
Cushiontone Type A-1	1/2"	1	.06	.18	.56	.71	.65	.57	.55	12"x12"	.79	Painted by manufacturer, perforated 484 holes per sq ft 3/16" dia. 3/8" deep.	1941
Cushiontone Type A-1	1/2"	2	.07	.46	.59	.67	.74	.68	.60	12"x12"	.79	Painted by manufacturer, perforated as above.	1941
Cushiontone Type A-2	5/8"	1	.08	.19	.63	.82	.74	.81	.60	12"x12"	.91	Painted by manufacturer, perforated as above, holes 1/2" deep.	1941
Cushiontone Type A-2	5/8"	2	.06	.49	.68	.83	.76	.74	.70	12"x12"	.91	Painted by manufacturer, perforated as above.	1941
Cushiontone Type A-3	7/8"	1	.10	.30	.78	.78	.68	.50	.65	12"x12"	.95	Painted by manufacturer, perforated as above, holes 3/4" deep.	1942
Cushiontone Type A-3	7/8"	2	.15	.65	.66	.78	.67	.53	.70	12"x12"	.95	Painted by manufacturer, perforated as above.	1942
Temlok DeLuxe	1/2"	4	.12	.24	.39	.31	.31	.32	.30	48"x54"	1.18	Painted by manufacturer,	1937
Temlok DeLuxe	7/8"	4	.22	.46	.35	.32	.39	.57	.40	48"x54"	1.19	Painted by manufacturer,	1937

Material	Thickness	Mounting (See Page 5)	Coefficients 128	256	512	1024	2048	4096	Noise Coef.	Size of Unit Tested.	Wt. (lb) sq ft	Surface	Date
BASALT ROCK COMPANY													
Basalt Rock Type A	5"	4	.32	.81	.75	.73	.74	.73	.75	18"x24"	25.2	Unpainted	1938
SAMUEL CABOT, INC.													
Cabots Quilt	-	4	.12	.30	.69	.82	.41	.31	.55	-	.41	Covered with paper	1938
THE CELOTEX CORPORATION													
Absorbex Type A on 1" Absorbex Type F (10 gauge)	2"	4	-	.39	.80	.96	.92	-	.75	9"x9" tile on 20 x 64" sheets	-	Spray painted by manufacturer.	1932
Absorbex Type A	1"	1	.09	.24	.62	.89	.73	.73	.60	12"x12"	2.4	Unpainted	1939
Absorbex Type A	1"	1	.14	.49	.83	.61	.30	.22	.55	12"x12"	-	Same as above, brush painted 5 coats at NBS	1939
Absorbex Type A	1"	9	.19	.63	.95	.86	.78	.77	.80	18"x18"	2.6	Unpainted	1936
Absorbex Type A	1"	2 (18"o.c.)	.19	.33	.80	.86	.80	.83	.70	18"x18"	2.7	Kerfed, spray painted 4 coats at NBS	1936
Absorbex Type C	1"	4	.14	.19	.34	.73	.62	.62	.45	20"x64"	-	Unpainted	1932
Absorbex Type C (14 gauge)	1"	2 (20"o.c.)	.14	.21	.67	.69	.59	.62	.55	20"x64"	-	Unpainted	1932
Absorbex Type F (10 gauge)	1"	2 (16"o.c.)	.06	.17	.47	.66	.53	-	.45	20"x64"	-	Spray painted by manufacturer.	1934
Absorbex Type F (8 guage)	2"	7	.13	.47	.98	.70	.78	.70	.75	20"x64"	4.7	Spray painted 4 coats at NBS	1934
Acousti-Celotex Type Cl	1/2"	1	.12	.26	.48	.50	.46	.56	.45	12"x12"	.78	R.I. finish perforated 441 holes per sq ft, 3/16" dia., 3/8" deep	1936
Acousti-Celotex Type Cl, Slow burning.	1/2"	1	.17	.24	.40	.45	.43	.51	.40	12"x12"	.88	Unpainted, perforated as above.	1936

THE CELOTEX CORPORATION (CONTINUED)

Material	Thickness	Mounting (See Page 5)	Coefficients 128	256	512	1024	2048	4096	Noise Coef.	Size of Unit Tested.	Wt. (lb) sq ft	Surface	Date
Acousti-Celotex Type C2	5/8"	1	.11	.31	.71	.80	.67	.57	.60	12"x12"	.88	R.I. finish, perforated as above, holes 1/2" deep.	1936
Acousti-Celotex Type C2	5/8"	2	.14	.65	.63	.73	.67	.55	.65	12"x12"	.88	Same as above	1936
Acousti-Celotex Type C2, Slow burning.	5/8"	1	.09	.25	.68	.79	.69	.66	.60	12"x12"	.89	Unpainted, perforated as above.	1937
Acousti-Celotex Type C2, Slow burning.	5/8"	2	.12	.48	.64	.70	.62	.49	.60	12"x12"	1.07	Painted by manufacturer, perforated as above.	1939
Acousti-Celotex Type C3	13/16"	1	.10	.30	.78	.85	.59	.42	.65	12"x12"	0.94	R.I. finish, perforated as above, holes 5/8" deep.	1939
Acousti-Celotex Type C3	13/16"	1	.08	.33	.83	.86	.53	.37	.65	12"x12"	-	Same as above, except brush painted 4 coats NBS.	1939
Acousti-Celotex Type C3	13/16"	8	.55	.66	.66	.80	.69	.52	.70	12"x24"	1.09	R.I. finish, perforated as above.	1936
Acousti-Celotex Type C3 Slow burning	13/16"	1	.18	.36	.67	.74	.67	.66	.60	12"x12"	1.35	Unpainted, perforated as above.	1936
Acousti-Celotex Type C3 Slow burning	13/16"	8	.45	.58	.67	.91	.71	.66	.70	12"x24"	1.06	Unpainted, perforated as above.	1937
Acousti-Celotex Type C4	1 1/4"	1	.17	.48	.97	.72	.50	.41	.65	12"x12"	1.58	R.I. finish, perforated as above, holes 1 1/16" deep.	1936
Acousti-Celotex Type C4	1 1/4"	8	.53	.68	.96	.78	.60	.50	.75	12"x24"	1.44	Same as above	1936
Acousti-Celotex Type C4 Slow burning	1 1/4"	1	.13	.51	.94	.84	.58	.52	.70	12"x12"	1.80	Unpainted, perforated as above.	1936

THE CELOTEX CORPORATION (CONTINUED)

Material	Thickness	Mounting (See Page 5)	Coefficients 128	256	512	1024	2048	4096	Noise Coef.	Size of Unit Tested.	WT. (lb) sq ft	Surface	Date
Acousti-Celotex Type C4 Slow burning	1 1/4"	8	.43	.62	.78	.81	.61	.40	.70	12"x24"	1.93	Painted by manufacturer, perforated as above.	1939
Acousti-Celotex Type C5	13/16"	1	.15	.24	.62	.73	.70	.71	.55	12"x12"	-	Unpainted, perforated 441 holes per sq ft, 1/4" dia., 5/8" deep.	1931
Acousti-Celotex Type C5	13/16"	1	.13	.26	.62	.78	.86	.77	.65	12"x12"	-	Same as above, brush painted 1 coat glue size, 4 coats lead and oil at NBS.	1931
Acousti-Celotex Type C5	13/16"	2	.09	.56	.77	.90	.78	.62	.75	12"x12"	.86	Unpainted, perforated as above, holes 5/8" deep.	1933
Acousti-Celotex Type C5 Slow burning	13/16"	8	.57	.70	.63	.84	.78	.68	.70	12"x12"	1.12	Painted by mfr., perforated as above, holes 5/8" deep.	1939
Acousti-Celotex Type C6	1 1/4"	4	.12	.41	.90	.92	.66	.64	.70	12"x12"	1.44	Unpainted, perforated as above, holes 1"deep.	1932
Acousti-Celotex Type C6 Slow burning	1 1/4"	8	.56	.72	.77	.92	.63	.53	.75	12"x24"	1.65	Painted by mfr. perforated as above, holes 1" deep.	1939
Acousti-Celotex Type C8	1"	2	.20	.62	.66	.75	.73	.48	.70	24"x48"	1.44	R.I. finish, perforated 462 holes per sq ft, 3/16" dia., 7/8" deep.	1940
Acousti-Celotex Type C9	3/4"	1	.11	.32	.74	.81	.54	.45	.60	12"x12"	1.06	Painted by mfr., perforated 441 holes per sq ft, 3/16" dia., 11/16" deep.	1941
Acousti-Celotex Type C9	3/4"	2	.14	.62	.72	.76	.58	.48	.65	12"x12"	1.06	Painted by mfr., perforated as above.	1941
Acousti-Celotex Type C9	3/4"	8	.43	.66	.73	.77	.62	.48	.70	12"x24"	1.00	Painted by mfr., perforated as above.	1941

THE CELOTEX CORPORATION (CONTINUED)

Material	Thickness	Mounting (See Page 5)	Coefficients 128	256	512	1024	2048	4096	Noise Coef.	Size of Unit Tested	Wt (lb) sq ft	Surface	Date
Acousti-Celotex Type M1	9/16"	1	.11	.29	.68	.74	.82	.74	.65	12"x12"	1.23	Painted by mfr., perforated 676 holes per sq ft, 5/32" dia., 1/2" deep.	1936
Acousti-Celotex Type M2	1"	8	.38	.54	.66	.95	.73	.68	.70	12"x24"	2.32	Painted by mfr., perforated as above, holes 7/8" deep.	1939
Muffletone, Standard finish	3/4"	1	.13	.36	.65	.62	.70	.69	.60	12"x12"	1.62	Unpainted	1938
Muffletone, Standard finish	1"	1	.19	.45	.84	.87	.83	.88	.75	12"x12"	1.83	Painted by manufacturer.	1938
Muffletone, Standard finish	1"	1	.15	.46	.75	.80	.72	.68	.70	12"x12"	1.84	Unpainted	1938
Muffletone Standard finish	1"	1	.13	.44	.78	.80	.75	.82	.70	12"x12"	-	Same as above, spray painted 3 coats at NBS.	1938
Muffletone, Fissured finish	1"	1	.16	.45	.71	.69	.71	.70	.65	12"x12"	1.96	Unpainted	1938
Muffletone, Fissured finish	1"	1	.16	.44	.68	.69	.69	.71	.65	12"x12"	-	Same as above, spray painted 3 coats at NBS.	1938
Muffletone, Fissured finish	1"	1	.14	.41	.82	.77	.75	.78	.70	12"x12"	1.94	Unpainted	1942

THE FELTERS COMPANY, INC.

Felt	1"	4	.11	.40	.80	.84	.78	.98	.70	-	.96	No surface covering.	1938

R. GUASTAVINO COMPANY

Akoustolith Tile Grade B-1	1 1/4"	5 (12"o.c., not nailed)	.41	.83	.78	.72	.78	.82	.80	6"x12"	5.8	Unpainted	1936
Akoustolith Tile Grade B-2	1"	4	.09	.17	.46	.77	.77	.58	.55	6"x12"	4.6	Unpainted	1932
Akoustolith Tile Grade B-2	1 1/2"	4	.14	.30	.67	.87	.82	.57	.65	6"x12"	6.1	Unpainted	1932

R. GUASTAVINO COMPANY (Cont'd)

Material	Thickness	Mounting (See Page 5)	Coefficients 128	256	512	1024	2048	4096	Noise Coef.	Size of Unit Tested	Wt (lb) sq ft	Surface	Date
Akoustolith Tile Grade B-2	2"	4	.21	.50	.85	.81	.70	.70	.70	6"x12"	8.5	Unpainted	1932
Akoustolith Tile Grade C	1 1/2"	4	.12	.19	.44	.61	.66	.56	.50	6"x12"	7.5	Unpainted	1930
Akoustolith Tile Grade C	2"	4	.19	.26	.53	.64	.70	.56	.55	6"x12"	10.1	Unpainted	1930
Akoustolith Tile Grade C	4"	10 (Not nailed)	.54	.70	.78	.85	.88	.81	.80	12"x12"	19.5	Unpainted	1937
Akoustolith Tile Grade C	4"	4	.32	.82	.90	.77	.79	.81	.80	12"x12"	19.5	Unpainted	1937
Akoustolith Tile Grade C	5"	4	.43	.92	.91	.88	.86	.74	.90	12"x12"	24.4	Unpainted	1937
Akoustolith Tile Grade C	5"	10 (Not nailed)	.60	.80	.95	.91	.90	.78	.90	12"x12"	24.4	Unpainted	1937
Akoustolith Tile Grade C	5"	5 (Not nailed)	.67	.80	.96	.93	.80	.87	.85	12"x12"	24.4	Unpainted	1937
Akoustolith Tile Grade D	1"	4	.08	.13	.25	.54	.67	.42	.40	-	-	Unpainted	1930
Akoustolith Tile Grade D	2"	4	.15	.26	.59	.74	.52	.50	.55	-	-	Unpainted	1930
Akoustolith Tile Grade D	4"	10 (Not nailed)	.54	.80	.70	.88	.87	.74	.80	12"x12"	18.8	Unpainted	1937
Akoustolith Tile Grade D	4"	4	.27	.76	.93	.78	.74	.69	.80	12"x12"	18.8	Unpainted	1937
Akoustolith Tile Number 104	4"	4	.40	.75	.80	.80	.75	.82	.80	18"x40"	21.2	Unpainted	1940

INDUSTRIALS INC. OF WISCONSIN

Softone	1"	1	.12	.36	.69	.72	.66	.71	.60	12"x12"	2.18	Painted by manufacturer	1942

THE INSULITE COMPANY

Material	Thickness	Mounting (See Page 5)	Coefficients 128	256	512	1024	2048	4096	Noise Coef.	Size of Unit Tested.	Wt (lb) sq ft	Surface	Date
Acoustilite	3/4"	1	.16	.34	.79	.72	.69	.64	.65	12"x12"	.59	Painted by manufacturer	1939
Acoustilite	3/4"	2	.12	.49	.80	.85	.80	.83	.75	12"x12"	.57	Painted by manufacturer	1940
Acoustilite	3/4"	2	.11	.53	.82	.82	.72	.68	.70	12"x12"	-	Spray painted 2 coats at NBS.	1940
Acoustilite	3/4"	2	.19	.73	.67	.55	.39	.32	.60	12"x12"	-	Spray painted 4 coats at NBS.	1940
Fiberlite	1/2"	1	.07	.20	.53	.77	.74	.74	.55	12"x12"	.41	Painted by manufacturer	1939
Fiberlite	1/2"	2	.07	.40	.72	.75	.80	.78	.65	12"x12"	.44	Painted by manufacturer	1940

JOHNS-MANVILLE SALES CORPORATION

Material	Thickness	Mounting (See Page 5)	128	256	512	1024	2048	4096	Noise Coef.	Size of Unit Tested.	Wt (lb) sq ft	Surface	Date
Air-Acoustic Sheets	1/2"	11	.14	.45	.53	.70	.67	.70	.60	18"x24"	.80	Unpainted	1938
Air-Acoustic Sheets	1"	11	.31	.55	.70	.74	.76	.76	.70	18"x24"	1.51	Unpainted	1938
Fibracoustic	1"	1	.17	.45	.79	.73	.74	.73	.70	12"x12"	.54	Painted by manufacturer	1942
Fibracoustic	1"	2	.17	.77	.74	.71	.71	.81	.75	12"x12"	.54	Painted by manufacturer	1942
Nashkote A	3/4"	1	.09	.16	.27	.30	.23	.23	.25	36"x48"	-	Painted 2 coats oil.	1929
Nashkote A	3/4"	1	.11	.21	.51	.68	.71	.68	.55	36"x48"	-	Same as above except membrane perforated with fine holes after painting.	1929
Nashkote A	1"	1	.12	.20	.33	.33	.28	.28	.30	36"x48"	-	Painted 2 coats oil paint.	1929
Nashkote A	1"	1	.13	.26	.58	.73	.77	.71	.60	36"x48"	-	Same as above except membrane perforated with fine holes after painting.	1929
Permacoustic	3/4"	1	.12	.35	.74	.74	.72	.75	.65	12"x12"	1.69	Unpainted	1942
Permacoustic	1"	5 (Not nailed)	.27	.74	.66	.82	.70	.70	.75	12"x12"	2.33	Unpainted	1938
Permacoustic	1"	1	.20	.62	.83	.74	.77	.80	.75	12"x12"	2.33	Unpainted	1938
Sanacoustic, Rockwool pad plus Metal facing & pad supports, plus furring =	1 5/8" 2 1/2"	3	.18	.58	.96	.91	.82	.74	.80	12"x24"	Pad 1.2	Perforated enameled metal surface, 4608 holes per sq ft., .068" diameter.	1940

JOHNS-MANVILLE SALES CORPORATION (Cont'd)

Material	Thickness	Mounting (See Page 5)	Coefficients 128	256	512	1024	2048	4096	Noise Coef.	Size of Unit Tested.	Wt (lb) sq ft	Surface	Date
Sanacoustic, same as above except every other tile was not perforated and contained no pad.	As above.	3	.15	.86	.66	.66	.49	.44	.65	12"x24"	Pad 1.2	Enameled metal surface. Perforated pans had 4608 holes per sq ft, .068" diameter.	1940
Sanacoustic, pad plus metal facing and pad supports, plus furring =	1 5/8" 5 1/4"	8	.43	.94	.77	.82	.78	.72	.85	12"x24"	Pad 1.2	Perforated enameled metal surface, 4608 holes per sq ft, .068" diameter.	1940
Sancoustic, same as above, except every other tile was not perforated and contained no pad.	As above	8	.54	.72	.57	.62	.50	.43	.60	12"x24"	Pad 1.2	Enameled metal surface. Perforated pans had 4608 holes per sq ft, .068" diamater.	1940
Sound Isolation Blanket (Rockwool)	-	4	.11	.58	.85	.83	.81	.83	.75	-	1.5	Metal lath.	1932
Studio Element	1"	4	.16	.54	.72	.74	.71	.81	.70	22"x36"	1.47	No covering.	1937
Transite Acoustical Units.	1 1/8"	4	.19	.39	.77	.74	.70	.55	.65	12"x12"	3.0	Transite, perforated 576 holes per sq ft, diameter 5/32"	1931

DAVID E. KENNEDY, INC.

Kencoustic (cork)	1"	1	.05	.12	.48	.65	.38	.47	.40	12"x12"	.79	Painted by manufacturer.	1939
Kencoustic (cork)	1 1/2"	1	.09	.16	.66	.64	.50	.62	.50	12"x18"	.88	Painted by manufacturer.	1938
Kentex	1"	1	.18	.36	.53	.48	.45	.35	.45	11½x11½"	.78	Unpainted.	1942
Koustex	3/4"	1	.08	.21	.62	.85	.70	.70	.60	12"x12"	1.48	Painted by manufacturer.	1942
Koustex	3/4"	8 (12" air space)	.66	.82	.52	.58	.64	.66	.65	12"x12"	1.43	Painted by manufacturer.	1942
Koustex	1"	1	.12	.29	.75	.87	.71	.76	.65	12"x12"	2.24	Unpainted.	1939
Koustex	1 1/4"	1	.13	.33	.72	.95	.77	.86	.70	12"x12"	2.2	Painted by manufacturer.	1940

Material	Thickness	Mounting (See Page 5)	Coefficients 128	256	512	1024	2048	4096	Noise Coef.	Size of Unit Tested.	Wt (lb) sq ft	Surface	Date
LUSE STEVENSON COMPANY													
Absorbatone	1"	10	.40	.91	.82	.80	.78	.86	.85	12"x24"	2.2	Unpainted	1940
Absorbatone	1"	2	.10	.31	.71	.93	.78	.84	.70	12"x24"	2.4	Unpainted	1941
MITCHELL & SMITH													
Pyrocustic	13/16"	1	.10	.30	.79	.84	.86	.80	.70	12"x12"	1.1	Unpainted	1940
Pyrocustic	13/16"	1	.11	.42	.78	.82	.70	.65	.70	12"x12"	-	Spray painted 2 coats at NBS.	1940
NATIONAL GYPSUM COMPANY													
Acoustex Type 30R	5/8"	2	.11	.20	.59	.91	.85	.72	.65	12"x12"	1.34	Unpainted	1938
Acoustex Type 40R	3/4"	1	.06	.17	.37	.68	.82	.74	.50	12"x12"	1.75	Unpainted	1938
Acoustex Type 40R	3/4"	2	.15	.22	.61	.93	.79	.69	.65	12"x12"	1.54	Unpainted	1938
Acoustex Type 50R	7/8"	2	.13	.28	.70	.98	.85	.87	.70	12"x12"	1.79	Unpainted	1938
Acoustex Type 60R	1"	1	.07	.24	.55	.87	.86	.88	.65	12"x12"	-	Unpainted	1937
Acoustex Type 60R	1"	2 (1" x 3" furring)	.11	.33	.77	.92	.70	.96	.70	12"x12"	2.07	Unpainted	1936
Acoustex Type 60R	1"	1	.07	.22	.54	.87	.78	.77	.60	12"x12"	2.31	Painted by manufacturer.	1939
Acoustex Type 60R	1"	1	.09	.27	.71	.92	.62	.62	.65	12"x12"	-	Same as above, brush painted 5 coats at NBS.	1939
Acoustex Type 70R	1 1/8"	1	.12	.28	.70	.96	.84	.88	.70	12"x12"	2.5	Unpainted	1940
Acoustex Type 70R	1 1/8"	2	.15	.37	.84	.92	.78	.80	.75	12"x12"	2.5	Unpainted	1940
Acousti-Metal, Rockwool pad plus metal facing and pad supports, plus furring =	1 5/8" 5 1/4"	8	.40	.84	.87	.93	.82	.70	.85	12"x24"	0.98 (Pad)	Perforated enameled metal, 4608 holes per sq ft, .068" diameter.	1939
Acousti-Metal, same as above, except every other tile was not perforated and contained no pad. Fastened to 13/16" furring instead of 3 5/8"	3 1/2	8	.22	.75	.65	.64	.49	.34	.65	12"x12"	0.98 (Pad)	Enameled metal surface. Perforated pans had 4608 holes per sq ft, 0.68" diameter.	1941

NATIONAL GYPSUM COMPANY (Continued)

Material	Thickness	Mounting (See Page 5)	Coefficients 128	256	512	1024	2048	4096	Noise Coef.	Size of Unit Tested	Wt (lb) sq ft	Surface	Date
Acousti-Metal-B, perforated metal on each face and filled with 4 lb density glass mineral wool.	3 1/2"	4	.46	.94	.98	.89	.83	.79	.90	24"x48"	4.44	Enameled metal surface, 4608 holes per sq ft, .068" diameter.	1942
Acousti-Metal-B, perforated metal on each face and filled with 6 lb density glass mineral wool.	3 1/2"	4	.49	.99	.98	.91	.86	.78	.95	24"x48"	5.25	Same as above.	1942
Econacoustic	1/2"	1	.09	.21	.66	.73	.72	.86	.60	12"x12"	0.48	Unpainted.	1940
Econacoustic	1/2"	2	.08	.45	.67	.62	.66	.78	.60	12"x12"	0.48	Unpainted.	1940
Econacoustic	1"	1	.14	.51	.78	.78	.78	.82	.70	12"x12"	0.71	Unpainted.	1939
Econacoustic	1"	1	.19	.48	.78	.74	.75	.80	.70	12"x12"	-	Same as above, except spray painted 3 coats.	1939
Econacoustic	1"	1	.18	.50	.79	.74	.71	.67	.70	12"x12"	-	Same as above, except spray painted 7 coats.	1939
Travacoustic	1"	1	.11	.44	.82	.83	.77	.77	.70	12"x12"	2.04	Unpainted.	1940

OWENS-CORNING FIBERGLAS CORPORATION

Fiberglas Acoustical Blankets	1"	4	.27	.63	.75	.75	.78	.75	.75	-	.44	Covered with thin muslin.	1938
Fiberglas Acoustical Blankets	2"	4	.34	.72	.87	.87	.75	.70	.80	-	.72	Same as above.	1938
Fiberglas Acoustical Blankets	3"	4	.39	.91	.97	.91	.82	.85	.90	-	1.07	Same as above.	1938
Fiberglas OC-9 Board	3/4"	5	.21	.72	.93	.93	.89	.91	.85	12"x12"	.60	Unpainted	1942

THE SPHINX ACOUSTICAL COMPANY

Material	Thickness	Mounting (See Page 5)	Coefficients 128	256	512	1024	2048	4096	Noise Coef.	Size of Unit Tested	Wt (lb) sq ft	Surface	Date
Sphinxstone	2"	4	.10	.33	.78	.87	.71	.70	.65	18"x24"	-	Unpainted	1932
UNITED CORK COMPANIES													
Acoustical Cork "B"	1 1/2"	2	.09	.57	.37	.33	.29	.41	.40	12"x12"	.94	Unpainted	1939
UNITED STATES GYPSUM COMPANY													
Acoustone Type D	9/16"	1	.09	.19	.62	.80	.78	.74	.60	12"x12"	1.09	Unpainted	1939
Acoustone Type D	11/16"	1	.07	.24	.68	.82	.76	.73	.65	12"x12"	1.30	Unpainted	1939
Acoustone Type D	13/16"	1	.11	.38	.79	.81	.77	.82	.70	12"x12"	1.40	Unpainted	1939
Acoustone Type D	15/16"	1	.11	.46	.85	.85	.92	.87	.75	12"x12"	1.48	Unpainted	1940
Acoustone Type F	9/16"	1	.07	.17	.56	.88	.82	.83	.60	12"x12"	.88	Unpainted	1940
Acoustone Type F	11/16"	1	.09	.22	.67	.84	.78	.80	.65	12"x12"	1.15	Unpainted	1940
Acoustone Type F	13/16"	1	.09	.34	.82	.91	.81	.86	.70	12"x12"	1.24	Unpainted	1940
Acoustone Type F	15/16"	1	.10	.39	.83	.88	.81	.82	.75	12"x12"	1.46	Unpainted	1940
Acoustone Type F	9/16"	1	.07	.19	.60	.85	.84	.78	.60	12"x12"	.97	Mill painted	1940
Acoustone Type F	11/16"	1	.07	.22	.75	.92	.82	.81	.70	12"x12"	1.13	Mill painted	1940
Acoustone Type F	13/16"	1	.14	.31	.86	.87	.78	.77	.70	12"x12"	1.33	Mill painted	1940
Acoustone Type F	15/16"	1	.20	.48	.92	.87	.84	.78	.80	12"x12"	1.54	Mill painted	1940
Acoustone Type F	13/16"	8	.34	.75	.71	.72	.79	.77	.75	12"x12"	1.31	Mill painted	1940
Perfatone, Rockwool pad, plus metal facing and pad supports, plus furring =	1 5/8" 8"	8	.48	.79	.80	.90	.87	.71	.85	12"x24"	.93 (Pad)	Perforated enameled metal, 4608 holes per sq ft, .073" diameter.	1939
Quietone	1/2"	1	.10	.22	.56	.69	.66	.69	.55	12"x12"	0.47	Unpainted, sand finish	1939
Quietone	1"	4	.06	.47	.76	.74	.72	.76	.65	12"x12"	0.81	Unpainted, brush finish	1932

WOOD CONVERSION COMPANY

Material	Thickness	Mounting (See Page 5)	Coefficients 128	256	512	1024	2048	4096	Noise Coef.	Size of Unit Tested	Wt (lb) sq ft	Surface	Date
Balsam Wool	1"	4	.18	.36	.55	.65	.67	-	.55	-	.29	Scrim facing.	1928
Nuwood Bevel Lap Tile	1/2"	6	.12	.19	.30	.40	.40	.51	.30	12"x12"	0.69	Unpainted.	1931
Nuwood Bevel Lap Tile	1"	6	.14	.19	.37	.37	.41	.56	.35	12"x12"	1.41	Unpainted.	1931

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TABLE 2

Acoustic Materials for Plastic Application

Unless otherwise stated, each sample of acoustical plaster was mixed according to the specifications furnished by the manufacturers and applied by a skilled plasterer on a false ceiling at the National Bureau of Standards. All samples of material applied with an air gun or blower were constructed at NBS unless otherwise stated. The panels were laid on the floor of the Reverberation Chamber for test.

Material	Thickness	Coefficients						Noise Coef.	No. of Coats	Base Coat	Application	Surface Treatment	Date
		128	256	512	1024	2048	4096						
CALIFORNIA STUCCO PRODUCTS OF NEW ENGLAND, INC.													
Stucoustic Type A.D.	3/4"	.18	.36	.65	.65	.62	.62	.55	1st coat 7/16" 2nd coat 5/16"	3/4" Gypsum plaster	1st coat applied to half green base coat. 2nd coat applied 3 hours after 1st coat.	Finished with steel trowel.	1935
Stucoustic	1/2"	.12	.29	.52	.78	.74	.74	.60	1st coat 1/4" 2nd coat 1/4"	3/4" Gypsum plaster	1st coat applied to dry base coat. 2nd coat applied 24 hours after 1st coat.	Finished with steel trowel.	1939
THE CELOTEX CORPORATION													
Reverbolite (Regular)	1/2"	.19	.29	.51	.70	.69	.78	.55	1st coat 1/4" 2nd coat 1/4"	3/4" Gypsum plaster on metal lath.	1st coat applied on dry base coat. 2nd coat applied as soon as first coat had set.	Finished with steel trowel.	1938
Reverbolite (Pumice Aggregate)	1/2"	.18	.29	.41	.51	.55	.65	.45	1st coat 1/4" 2nd coat 1/4"	3/4" Gypsum plaster on metal lath.	1st coat applied on dry base coat. 2nd coat applied 24 hours after 1st coat.	Brushed with rice root brush then finished with steel trowel.	1938

Material	Thickness	Coefficients 128	256	512	1024	2048	4096	Noise Coef.	No. of Coats.	Base Coat	Application	Surface Treatment	Date
CLEVELAND GYPSUM SUPPLY COMPANY													
Hushkote Acoustic Plaster	1/2"	.13	.24	.45	.71	.56	.49	.50	1st coat 1/4" 2nd coat 1/4"	3/4" Gypsum plaster on metal lath.	1st coat applied to dry base coat. 2nd coat applied 24 hours after 1st coat.	Finished with steel trowel.	1935
Hushkote Acoustic Plaster	5/8"	.16	.34	.50	.53	.43	.37	.45	1st coat 3/8" 2nd coat 1/4"	3/4" Gypsum plaster on metal lath.	1st coat applied to dry base coat. 2nd coat applied 24 hours after 1st coat.	Finished with steel trowel.	1937
Hushkote Acoustic Plaster	3/4"	.28	.36	.45	.50	.53	.57	.45	1st coat 1/4" 2nd coat 1/4" 3rd coat 1/4"	3/4" Gypsum plaster on metal lath.	1st coat applied to dry base coat. 2nd coat applied 5 days after 1st coat. 3rd coat applied 3 days after 2nd coat.	Finished with steel trowel.	1938
THE DODSON MANUFACTURING COMPANY													
Dodson Acoustic Plaster	3/4"	.15	.25	.30	.35	.34	.26	.40	1st coat 1/2" 2nd coat 1/4"	1/4" Gypsum plaster on metal lath.	1st coat applied to half green base coat. 2nd coat applied as soon as 1st coat had taken initial set.	Finished with cork float and stippled to break surface film.	1939
R. GUASTAVINO COMPANY													
Plastacoustic	1/2"	.17	.28	.44	.81	.72	.72	.55	1st coat 1/4" 2nd coat 1/4"	3/4" Gypsum plaster	1st coat applied on dry base coat. 2nd coat applied 24 hours after 1st coat.	Finished with steel trowel.	1941

Material	Thickness	Coefficients 128	256	512	1024	2048	4096	Noise Coef.	No. of Coats.	Base Coat	Application	Surface Treatment	Date
GYPSUM INSULATION AND MANUFACTURING COMPANY													
Super-Acoustic Plaster	1/2"	.12	.24	.45	.71	.62	.63	.50	1st coat 1/4" 2nd coat 1/4"	3/4" Gypsum plaster on metal lath.	1st coat applied to dry base coat. 2nd coat applied 24 hours after 1st coat.	Finished with cork float.	1938
HOLLYWOOD STUCCO PRODUCTS													
Acoustic Plaster	1/2"	.10	.22	.42	.78	.78	.70	.55	1st coat 1/4" 2nd coat 1/4"	3/4" Gypsum plaster on metal lath.	1st coat applied to dry base coat. 2nd coat applied 24 hours after 1st coat.	Finished with cork float.	1939
KEASBEY AND MATTISON COMPANY													
Limpet (Sprayed Asbestos)	3/8"	.36	.92	.85	.81	.87	.91	.85	-	-	Applied with air gun on metal lath, 5 7/8" air space back of Limpet.	Finished with roller unpainted.	1942
Limpet (Sprayed Asbestos)	3/8"	.43	.91	.82	.67	.62	.61	.75	-	-	Same as above.	Same as above, except spray painted 5 coats at NBS.	1942
Limpet (Sprayed Asbestos)	1/2"	.25	.78	.97	.81	.82	.85	.85	-	-	Same as above.	Finished with roller, unpainted.	1941
Limpet (Sprayed Asbestos)	1/2"	.27	.75	.90	.75	.80	.88	.80	-	-	Same as above.	Same as above, except spray painted 2 coats at NBS.	1941
Limpet (Sprayed Asbestos)	3/4"	.41	.88	.90	.88	.91	.81	.90	-	-	Same as above.	Finished with roller, unpainted.	1941

KEASBEY AND MATTISON COMPANY (Continued)

Material	Thickness	Coefficients						Noise Coef.	Application	Surface Treatment	Date
		128	256	512	1024	2048	4096				
Limpet (Sprayed Asbestos)	3/4"	.49	.90	.93	.86	.81	.82	.90	Same as above.	Same as above, except spray painted 2 coats at NBS.	1941
Limpet (Sprayed Asbestos)	3/4"	.48	.91	.91	.86	.87	.87	.90	Same as above.	Same as above, except spray painted 10 coats at NBS.	1941
Limpet (Sprayed Asbestos)	5/8"	.32	.28	.50	.84	.85	.87	.60	Applied with air gun on gypsum wall board nailed on 2x4's, 16" on centers.	Finished with roller, unpainted.	1942
Limpet (Sprayed Asbestos)	5/8"	.38	.26	.67	.77	.72	.61	.60	Same as above.	Same as above, except spray painted 5 coats at NBS.	1942
Limpet (Sprayed Asbestos)	3/4"	.08	.19	.70	.89	.95	.85	.70	Applied with air gun on gypsum wall board.	Finished with roller, unpainted.	1941
Limpet (Sprayed Asbestos)	3/4"	.09	.23	.67	.90	.93	.87	.70	Same as above.	Same as above, except spray painted 2 coats at NBS.	1941
Limpet (Sprayed Asbestos)	1 1/2"	.16	.59	.98	.98	.97	.90	.90	Same as above.	Finished with roller, unpainted.	1941
Limpet (Sprayed Asbestos)	1 1/2"	.16	.62	.94	.98	.94	.91	.85	Same as above.	Same as above, except spray painted 2 coats at NBS.	1941

KELLEY ISLAND LIME AND TRANSPORT COMPANY

Material	Thickness	Coefficients						Noise Coef.	No. of Coats.	Base Coat	Application	Surface Treatment	Date
		128	256	512	1024	2048	4096						
Acoustic Plaster	1/2"	.17	.26	.52	.86	.71	.62	.60	1	Thin scratch coat gypsum plaster on metal lath.	Applied to dry scratch coat.	Stippled after plaster was partly dry.	1942
Acoustic Plaster	1/2"	.20	.26	.54	.84	.62	.45	.55	1	Same sample as above.	Same as above.	Spray painted 5 coats cold water paint.	1942

NATIONAL GYPSUM COMPANY

Material	Thickness	Coefficients 128	256	512	1024	2048	4096	Noise Coef.	No. of Coats	Base Coat	Application	Surface Treatment	Date
Macoustic Plaster (Trowel Finish)	1/2"	.15	.27	.42	.45	.36	.29	.40	1st coat 1/4" 2nd coat 1/4"	3/4" Gypsum plaster on metal lath.	1st coat applied to half green base coat. 2nd coat applied 2 hrs after 1st coat.	Finished with steel trowel.	1936
Macoustic Plaster (Trowel Finish)	1/2"	.17	.27	.52	.76	.66	.55	.55	1st coat 1/4" 2nd coat 1/4"	3/4" Gypsum plaster on metal lath.	1st coat applied to dry base coat. 2nd coat applied 24 hours after 1st coat.	Finished with steel trowel.	1937
Macoustic Plaster (Trowel Finish)	3/4"	.25	.41	.67	.63	.52	.47	.55	1st coat 3/8" 2nd coat 3/8"	3/4" Gypsum plaster on metal lath.	1st coat applied to dry base coat. 2nd coat applied 24 hrs after 1st coat.	Finished with steel trowel.	1937

NEWARK PLASTER COMPANY

Old Newark Acoustic Plaster	1/2"	.09	.23	.47	.77	.71	.75	.55	1st coat 1/4" 2nd coat 1/4"	3/4" Gypsum plaster on metal lath.	1st coat applied to dry base coat. 2nd coat applied 24 hours after 1st coat.	Finished with steel trowel.	1938

PACIFIC PORTLAND CEMENT COMPANY

Calacoustic Plaster	1/2"	.15	.28	.44	.67	.66	.66	.50	1st coat 1/4" 2nd coat 1/4"	3/4" Gypsum plaster on metal lath.	1st coat applied to dry base coat. 2nd coat applied 72 hours after 1st coat.	Finished with cork float.	1936

SPRAYO-FLAKE COMPANY

Material	Thickness	Coefficients						Noise Coef.	Application	Surface Treatment	Date
		128	256	512	1024	2048	4096				
Spray-Acoustic Type X	5/8"	.59	.87	.85	.88	.94	.83	.90	Applied with an air gun on metal lath. 3 5/8" air space back of material.	Finished with a roller. Surface sprayed with coat of binder.	1940
Spray-Acoustic Type X	5/8"	.65	.79	.80	.70	.83	.60	.80	Same as above.	Same as above, except brush painted 4 coats at NBS.	1940
Spray-Acoustic Type X	1 1/8"	.18	.52	.95	.93	.91	.87	.85	Applied with an air gun on gypsum wall board.	Finished with a roller. Surface sprayed with coat of binder.	1940
Spray-Acoustic Type X	1 1/8"	.15	.47	.88	.92	.87	.88	.80	Same as above.	Same as above, except spray painted 3 coats at NBS.	1940

UNITED STATES GYPSUM COMPANY

Material	Thickness	Coefficients						Noise Coef.	No. of Coats.	Base Coat	Application	Surface Treatment	Date
		128	256	512	1024	2048	4096						
Sabinite Plaster Hydraulic	1/2"	.14	.24	.27	.38	.48	.64	.35	1st coat 1/4" 2nd coat 1/4"	Gypsum plaster.	1st coat applied to dry base coat. 2nd coat applied after 1st coat had set and partly dried.	Floated with cork float.	1931
Sabinite Plaster A	1/2"	.16	.24	.38	.78	.75	.77	.55	1st coat 1/4" 2nd coat 1/4"	Gypsum plaster.	1st coat applied to dry base coat. 2nd coat applied 24 hours after 1st coat.	Floated with cork float.	1935

UNITED STATES GYPSUM COMPANY

Material	Thickness	Coefficients						Noise Coef.	No. of Coats.	Base Coat	Application	Surface Treatment	Date
		128	256	512	1024	2048	4096						
Sabinite Plaster A	3/4"	.13	.27	.59	.81	.74	.85	.60	1st coat 1/4" 2nd coat 1/4" 3rd coat 1/4"	3/4" Gypsum plaster on metal lath.	1st coat applied on dry base coat. 2nd coat applied 48 hours after 1st coat. 3rd coat applied 72 hours after 2nd coat.	Floated with cork float.	1935
Sabinite Plaster F	1/2"	.19	.22	.43	.80	.75	.75	.55	1st coat 1/4" 2nd coat 1/4"	3/4" Gypsum plaster on metal lath.	1st coat applied on dry base coat. 2nd coat applied 48 hours after 1st coat.	Floated with cork float.	1936
Sabinite Plaster M	1/2"	.16	.26	.48	.77	.83	.85	.60	1st coat 1/4" 2nd coat 1/4"	3/4" Gypsum plaster on metal lath.	1st coat applied on dry base coat. 2nd coat applied 24 hours after 1st coat.	Finished with steel trowel.	1940
Sabinite Plaster M	3/4"	.20	.32	.62	.79	.74	.85	.60	1st coat 3/8" 2nd coat 3/8"	3/4" Gypsum plaster on metal lath.	1st coat applied on dry base coat. 2nd coat applied 24 hours after 1st coat.	Finished with steel trowel.	1940

Table 3

Absorption per person for an audience seated in chairs of various types.

*Seating		128	256	512	1024	2048	Date
A	Women without coats	0.7	1.3	2.3	3.6	4.6	1930
A	Women with coats	1.3	2.4	4.0	5.8	6.7	1930
A	Men without overcoats	1.3	2.1	4.1	5.5	7.4	1930
A	Men with overcoats	2.3	3.2	4.8	6.2	7.6	1930
B	Mixed audience	-	-	3.9	4.7	-	1929
B	Empty seat	-	3.4	3.0	3.3	3.6	1929
C	Mixed audience	-	3.5	4.1	4.9	4.2	1930
C	Empty seat	-	3.0	2.5	2.9	3.1	1929
D	Mixed audience	-	2.7	3.3	3.8	3.6	1930
	Plywood chair	-	0.2	0.3	0.5	0.5	1930

The above absorption figures are numerically equal to the number of square feet of a material having an absorption coefficient of 1.00, which would absorb the same amount of sound energy.

*A . . . . cane seat chairs, open back.
*B . . . . theatre chairs, box spring seat, heavily padded back.
*C . . . . same as B, but single layer of padding on back.
*D . . . . church pews, seating five.

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Suggestions Concerning the Proper Use of Acoustical Material.

As there has been considerable misconception concerning the proper use of acoustical material it is considered desirable to call attention to two of the fundamental principles underlying the formulas which are used in acoustical design. It is assumed in all of the formulas that (1) the absorption is proportional to the area of the absorbing material, and that (2) there is a uniform distribution of sound energy. As a rule neither one of these assumptions is true.

It has been found from experiment when very small areas are used, such as the panels in a coffered ceiling having areas of from 1 to 4 square feet and separated from each other by a foot or more, that the effective absorption of the material in these panels is greater than when the material is installed in one large area. In fact, for materials having large coefficients, this effective absorption may be as much as 50 percent more than one would expect from the coefficient.

It has also been found when all of the acoustical material is applied on one surface of a relatively small room, say 50,000 cubic feet or under, that this creates a non-uniform distribution of sound energy in the following manner. Let us assume that the ceiling of a room is covered with a highly absorbent material. Under these conditions the sound energy which is traveling between the floor and ceiling is absorbed quite rapidly, while that traveling between the untreated wall surfaces, having very little to absorb it, may continue for some considerable time. This persistence of sound energy between the untreated surfaces may cause the measured reverberation time to be considerably longer than would be computed using the ordinary reverberation formula and the coefficient usually given. For this reason, it is essential in small rooms that the acoustical material be distributed on the side walls as well as on the ceiling, if the effective absorption of the material is to be anywhere near that which one would expect from the coefficient of the material. For further discussion of this problem see Circular C418.

We also wish to call attention to the fact that a proper distribution of the acoustical material should be worked out in the initial plans of a building, as it is frequently impossible to obtain a satisfactory distribution after the interior design has been completed without taking into account the acoustical treatment.